



TECHNICAL ARCHITECTURE REVIEW

Project Name:	Web Content Management
Requestor:	Randy Hughes
Date of Initial Request:	January 18, 2008
Request Description:	Review Web Content Management (WCM) solutions and make recommendations for suitability on an agency and/or enterprise level. GOED and USTAR are in need of both content management and Web collaboration tools. The GOPB Balanced Scorecard approach needs to be automated at the presentation layer level, and this type of tool, used in conjunction with a BI component may provide a good method for both roll-up and publication of appropriate materials using dashboard capabilities.
Agency or Agencies:	GOED, Enterprise
Reviewers:	Bob Woolley and Dave Fletcher
ARB Acceptance Date:	
Agency Requestor Acceptance Date:	

Introduction and Definitions

Web Content Management (WCM) began in the mid-1990s. Businesses and government agencies built Web sites to service the information demands of customers and citizens. Web site administrators soon concluded that their ability to manage collections of electronic documents and Web sites diminished with increasing size and scale. A number of vendors responded to market demand by creating WCM systems.

The need for WCM systems is applicable to all sizes of enterprises. All types of enterprises face similar issues of content control and currency. Many enterprises were averse to the large licensing prices demanded by the WCM pure-play vendors, such as Interwoven and Vignette, and as a result, they put together in-house solutions based on platforms like ColdFusion.

WCM has changed substantially over the last several years. Pure-play WCM companies like Interwoven and Vignette have been forced to diversify to compete with new market entrants to the enterprise space. The market for small to

medium sized enterprise solutions, and the realization that even in a large enterprise one solution may not fit, has enabled an emerging WCM battleground for market presence. As the established vendors struggle to change their pricing structures a new range of vendors has emerged to service smaller enterprises. Their products mimic the extant WCM functionality, but the prices are dramatically lower.

The other dynamic vector of evolution for small to medium enterprise (SME) WCM is the popularization of open-source solutions such as Plone and DotNetNuke. While these products offer enticing features they present a quandary to many IT managers and buyers. The price is right, but the lack of traditional support, presents challenges and uncertainties for IT management.

Regardless of solution type or licensing conditions, one thing is certain in this market. The explosive growth of information is driving renewed interest in WCM. A small to medium sized organization in 2008 must manage the same amount of data that a large enterprise may have done in the late 1990s. WCM has become a critical success factor for making Web information available and current, and with some degree of organizational control over content.

A Web CMS¹ provides the following key features:

Automated Templates

Create standard output templates (usually HTML and XML) that can be automatically applied to new and existing content, creating one central place to change that look across a group of content on a site.

Easily Editable Content

Once your content is separate from the visual presentation of your site, it usually becomes much easier and quicker to edit and manipulate. Most CMS software includes WYSIWYG editing tools, allowing non-technical individuals to create and edit content.

Scalable Feature Sets

Most CMS have plug-ins or modules that can be easily installed to extend an existing site's functionality.

Web Standards Upgrades

Active CMS solutions usually receive regular updates that include new feature sets and keep the system up to current Web standards.

¹ Wikipedia, *Web Content Management System*,
http://en.wikipedia.org/wiki/Web_content_management_system

Workflow Management

Workflow is the process of creating cycles of sequential and parallel tasks that must be accomplished in the CMS. For example, a content creator submits a story but it is not published on the Web site until the copy editor cleans it up, and the editor-in-chief approves it.

Document management

CMS solutions may provide a means of managing the life cycle of a document from initial creation time, through revisions, publication, archive, and document destruction.

Content virtualization

CMS systems may provide a means of allowing each user to work within a virtual copy of the entire Web site, document set, and/or code base. This enables changes to multiple interdependent resources to be viewed and/or executed in-context prior to submission.

Objectives and Scope of Review

The purpose of this review is to look at comparisons of WCM systems and identify functional recommendations for WCM implementation at the agency and enterprise level where applicable.

Current Vendor Alternatives and Evaluations

A cursory overview of available WCM options reveals the following:

- Open Source: 73.3%
- Proprietary: 26.7%

The CMS matrix² lists over 190 WCM solutions, most of which are open source.

In 2007 InfoTech did a comprehensive and detailed review of WCM solutions. Data from these in depth reviews has been utilized in making product comparisons and recommendations. The InfoTech research is particularly useful since it looked at both open source and proprietary solutions. Forrester Research also released several relevant studies in this area, but excluded most open source vendor solutions.

Analysis and comparisons consider solutions that have a department or workgroup scope and implementation as illustrated in Figure 1, and enterprise scope as illustrated in Figure 2.

² CMS Matrix www.cmsmatrix.org.

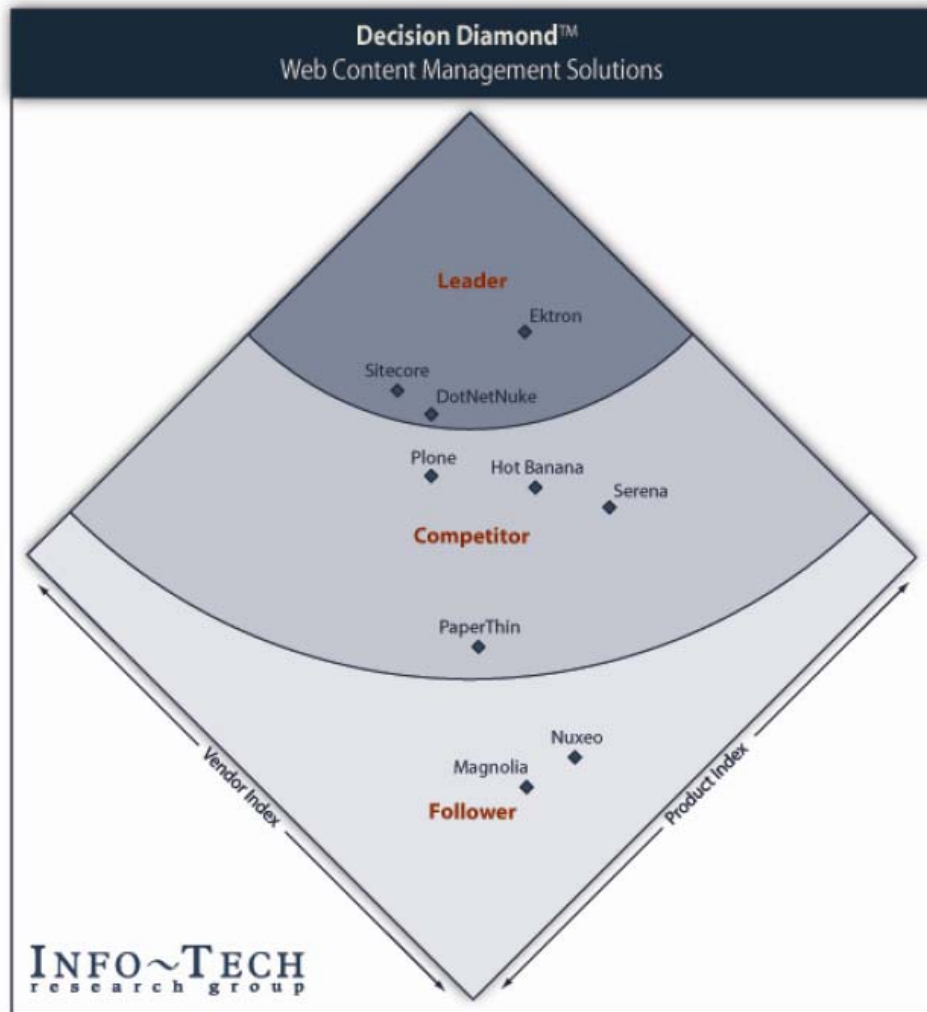


Figure 1. Small Enterprise WCM Solutions (Agency and Groups)

Nine of the leading vendors in this market segment were analyzed in depth, with Ektron, Sitecore, and DotNetNuke as the top players. Ektron, Sitecore, and DotNetNuke all placed in the Leader Zone. Ektron and Sitecore are commercial solutions. Ektron is the overall leader, in terms of pricing, ease of use, and availability of features. Sitecore also scored well in terms of pricing, ease of use, and features, but suffered for its relatively poor support history.

DotNetNuke is an open source solution that runs on Microsoft's .NET platform. It offers a wide range of features and is very well integrated with the .NET architecture. DotNetNuke's greatest strength is the wide availability of commercial support and published books and manuals. This commercial interest separates DotNetNuke from the other open source products.

From a State perspective, the implementation of .NET is somewhat limited, so alternative solutions such as Contribute and some of the Java based WCM solutions such as Alfresco and OpenCMS may initially be more attractive. OpenCMS is currently in use by the Department of Workforce Services.

Enterprise class solutions are dominated by large commercial vendors. These solutions assume availability of substantial and centrally controlled Web hosting and WCM infrastructure within the enterprise. Solutions tend to be costly and effective use requires a high level of disciplined buy in by the enterprise.

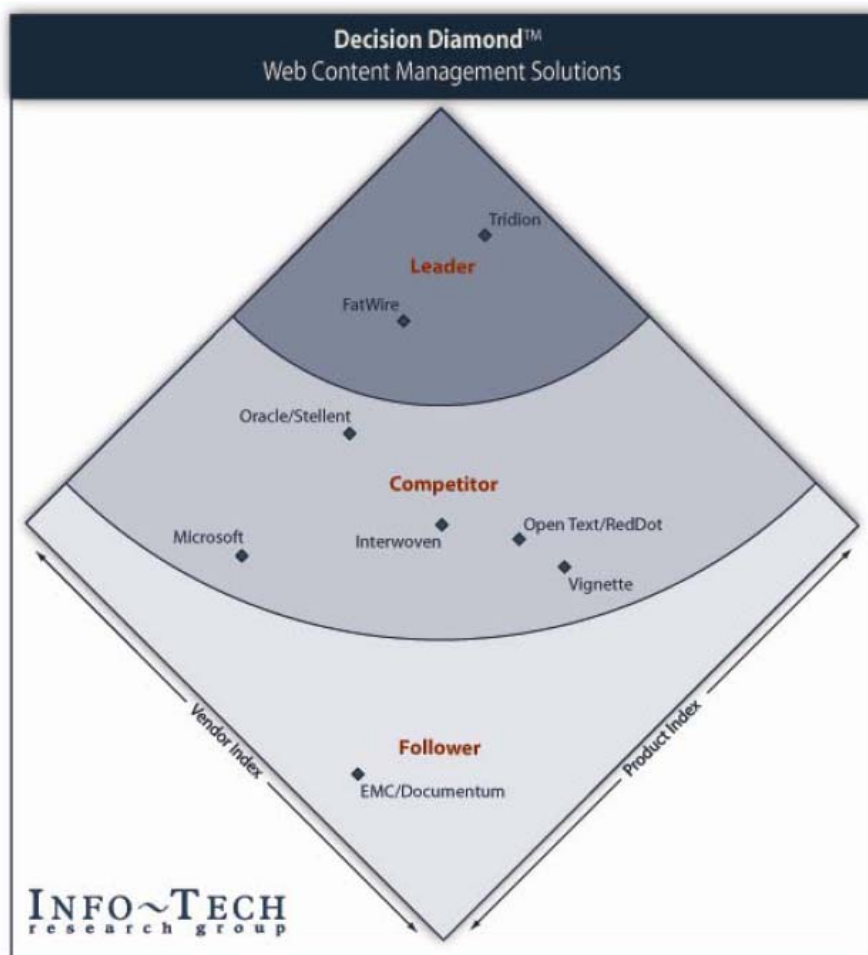


Figure 2. Small Enterprise WCM Solutions (Enterprise and Multi-Agency)

Tridion combines robust WCM functionality with a good vision of the future direction of WCM. Basic content management and content editing features are strong, but Tridion's advanced features are noteworthy. Tridion provides ongoing product developments for integrating content generated from transactional applications.

FatWire offers robust basic content management and authoring features. FatWire has substantial strength when it comes to analytics and the creation of personalized content for segmented Web browsers. This functionality gives FatWire a feature advantage over competitors with a traditional Enterprise Content Management (ECM) orientation.

“The Competitor Zone is dominated by two different types of WCM vendors: the recent roll-ups and the walking dead.”³ The roll-ups include Oracle Stellent and Open Text RedDot. Both vendors represent a situation where a much larger company has acquired a former best-of-breed WCM provider. Both vendors offer mature and robust WCM solutions.

According to one analyst, “Vignette and Interwoven are the walking dead. Both companies are experiencing little organic growth and have acquired functionality in an effort to expand. The future of these companies is therefore far from certain.”⁴

Baseline of Current Architecture

Aside from very small open source implementations such as Zope, which have not have been consistently identified, the State has relatively few WCM solutions in actual production environments. Contribute is the most frequently used WCM platform and its use is limited to a few agencies. Most WCM activity focuses on getting content changes from business users with IT or other information analysts making the content revisions. Current installations of Documentum and Alfresco are primarily focused on Document Management (DM) and have either not utilized, or made minimal use of, the content management capabilities of the applications.

Best Practices Review

Forrester has identified five major pitfalls⁵ with corresponding best practices for use and implementation of WCM systems. These include:

- **WCM must be a business-driven project.** IT managers who drive these initiatives from a technology perspective may have difficulty getting buy-in from the business units, find they are unable to finalize feature sets when forced to mediate between groups with differing needs, and solely bear the burden of responsibility when the inevitable problems arise. The lack of buy-in from the business can be particularly vexing to IT managers, as it may result in “renegade” WCM implementations that were initially implemented by the business but whose support eventually falls to IT staff.
- **User involvement is essential when designing and implementing a successful UI and content approval workflow.** Even when business drives content management, workflow, in practice, is often different from the original. Designing and implementing a content-editing application without enough input from users can result in increased support and

³ *Web Content Management Solutions*, Info-Tech Advisor Premium Applications: Product Comparison, February 22, 2007.

⁴ *Ibid.*

⁵ Powers, Stephen, et al. *Five Pitfalls to Avoid In Web Content Management Implementations*, Best Practices, Forrester Research, Inc., February 23, 2007.

training time, as well as high frustration levels. If users do not like the workflow, they may not like the system, and perceive it as a failure.

- **Content contributors and template designers must be able to master the WCM system.** The system must support the needs of casual users as well as regular users with minimal retraining requirements. Undue complexity and richness of features can actually become an obstacle. A system that is difficult to use will result in IT support staff doing extra work, as they will have to perform tasks that should be done by those in the lines of business.
- **Avoid excessively complex requirements.** IT staff can easily get caught in the trap of trying to define every single feature of the current site, regardless of its importance to the business. This adds complexity that may add only limited value to the business.
- **Do not place IT in the middle of content workflows.** IT support staff should not be in the critical path of daily operations. Some systems require WCM administrators to make content live, remove content from the site, or add categories to taxonomies. IT managers often make the mistake of positioning Web site developers to do content template maintenance, and routine site content changes.
- **Sell a business sponsor on the importance of WCM.** An executive sponsor from the business needs to champion the project and help to define and prioritize the feature set.
- **Watch end users at work.** Do not just gather requirements from conversations with the users. Observe users at work. Examine and understand their day-to-day workflow. Use collaboration software to get a better view into user content creation, content approval, and content delivery processes.
- **Understand that WCM success is about ease of use.** One of the biggest issues that WCM vendors have yet to really address is the difficulty that end users have with mastering systems that are not easy to use, intuitive, or designed for content contributors who use the system on an infrequent basis.
- **Think big but start small and plan on incremental improvements.** Perform a content audit on your Web site to determine your current needs from a high level, and work with business managers and users to anticipate future needs. Start by focusing on a small site or a self-contained section of a site that can be launched under the new WCM within the context of the current site.

- **Make sure that IT implements and then gets out of the way.** Ensure that the content contributors become self-sufficient. Give users the ability to control the look and feel of their content with minimal help from IT.

Emerging Technologies and Trends

The key trend in this market space is the dominance of open source solutions and WCM applications that are easily adaptable to specialized business needs. Web 2.0 hosted content solutions and tool sets are also growing rapidly. The concept and need for a comprehensive one size fits all solution is losing acceptance in favor of specific implementations, albeit in many cases of the same product, to meet specialized business needs for WCM. Content centric WCM solutions with a strong focus on users are being directly supported by most vendors from enterprise to workgroup WCM providers.

Web 2.0 and Content Management

Although content management systems can improve the way content is managed on a large portal, new tools have been introduced over the past two to three years as Web 2.0, which in many cases races past the traditional CMS in facilitating the management of content on a Web site. Many CMS vendors have included these tools in their content management systems.

A brief look at some of the tools freely available as Web 2.0 includes:

- **RSS**—All news content should be made available as RSS in addition to text. Many tools are available for doing this painlessly. For example, the content can be generated through a blog which automatically creates the RSS feed. The blog can be set up as a template, with the same look and feel as the overall Web site, or it can simply be a content management tool that creates the RSS feed that is used to port the content to wherever it is presented.
- **GIS Content**—One of the most effective e-government uses was the creation of dynamic maps during the southern California fires. Tools like Google Maps and Microsoft Live allow multiple users to contribute content to dynamic maps in real time. Users were able to use these maps to identify evacuation routes, fire boundaries, traffic incidents, and other critical information in a very granular way and apply that information to their own individual situations.
- **Multimedia**—Multimedia content is an increasingly important part of digital government. Web 2.0 offers many tools to introduce and manage multimedia content on the Web that exceed the capabilities of many traditional content management systems. Podcast tools allow users to generate portable audio content from their phone or a variety of other endpoints. Tools like Viddler make it easy to upload video content to the Web and embed it in a Web site. Access to the video content also

becomes dynamic when the contributor can tag and comment at specific markers within the streaming video file.

- **Portability**—With Web 2.0, content contributors are no longer tied to a particular platform. Content can be provided with tools as diverse as e-mail, SMS texting, or just a simple phone call.
- **Dynamic Linking**—Del.icio.us and other Web tools make it easy to manage dynamic reference lists.
- **Tag Clouds and Custom Search**—Content management systems often provide ways to categorize and catalog content. Web 2.0 offers even more dynamic ways for prioritizing content based on user preferences. A tag cloud that is based on use patterns dynamically identifies content that is of most interest and presents it in a way that makes it easy for the users to navigate directly to the most commonly accessed information and services.
- **Gadgets and Widgets**—These tools offer an easy way to embed all kinds of content into a Web site, almost effortlessly.
- **Mashups**—Mashups combine data from oftentimes existing sources with presentation tools to create new and interesting understanding of the data at the presentation layer.

Web 2.0 tools offer some of the most relevant and dynamic new WCM capabilities and are in high demand and use on Web sites on a worldwide basis. These tools and their outputs are becoming a part of Web user expectations for content.

Internal Content-Specific Management Tools

Over time, various State agencies have developed or adapted content management solutions for specific types of content. These include photo galleries for visual images, multimedia databases, and news database tools to manage dynamic news-oriented content. These tools are often easy-to-use and adapted to specific government needs.

Financial Analysis

No detailed financial analysis has been provided on a product level. Licensing and support costs are either relatively small or, in the case of open source solutions, are usually non-existent. The primary cost drivers for WCM are initial installation and setup and ongoing maintenance and upgrades. Standard DTS hosting and storage rates will apply to WCM implementations.

Security Review and Analysis

Both commercial and open source solutions generally integrate with LDAP based directory structures. Rights and access control issues are either integral to the environment or managed through master directory resources such as the Utah Master Directory (UMD). No significant security issues have been identified,

Operational and Infrastructure Analysis

Hosting and storage issues are the principle operational concerns, as is directory integration and management of roles and privileges. The goal of operations will generally be one of transparency to the WCM user. Most of the major solutions run in standard server environments, either as a stand alone WCM server or as a service integrated within an agency site. All WCM environments provide robust access to a range of database alternatives that are currently supported by DTS.

Solution Delivery Impact and Analysis

WCM is critical to the effective and timely ability of the agency business to update and add information content. Solution delivery should integrate WCM practice into site design for agencies with the overall goal of producing the initial site design and enabling agency owners to easily add content and maintain currency. Issues of IT involvement on an ongoing basis need to be considered and limited by leveraging WCM.

Agency Services Impact and Analysis

Perhaps the biggest impact to an effective WCM implementation is empowerment of the agency to rapidly impact content on agency Web sites. This results in an overall improvement of information quality, and places IT in an enabling role that supports agency business requirements.

Summary and Recommendations

The State of Utah is in reality an aggregation of many different business units with varying requirements for WCM. An enterprise solution seems unlikely to be successful in adding meaningful value to agencies. A common implementation of one or more products is likely to be much more effective and accepted by the business. WCM is about enabling content creation and business participation in preference to the historical use of WCM as a control mechanism. Specific recommendations for the State include the following:

- Understand business needs before making WCM solution recommendations.
- Favor simplicity of use over breadth of features.
- Let agency business users drive the WCM selection and implementation based on business need with advice from IT.
- Identify a small set of recommended WCM tool alternatives for agency use.

- Perform an in depth review of solutions (such as Alfresco, Tridion, and FatWire) from the enterprise or large agency solutions.
 - Perform an in-depth review of solutions (such as Alfresco (all platforms), DotNetNuke (.NET), OpenCMS, and others) for agencies or smaller work groups.
- At the conclusion of the in-depth reviews, make recommendations for supported WCM platforms to agencies.
- Identify Web 2.0 WCM toolsets that may be appropriate for agency use.
- Create a matrix of sharable State-created and adapted content-specific tools.
- Integrate recommended WCM solutions with Utah Interactive Web site implementations for agencies so that there is a common approach to WCM implementation.
- Provide ongoing user training and support on the selected WCM platforms.
- Establish requirements for archiving and versioning of Web content. In today's environment, a lot of content is developed specifically for the Web and only resides there. Content management solutions should address the issue of maintaining historical information over time.
- Standardize authentication and approval processes where possible. Keep these processes simple and easy to use.
- Identify preferred standards for Web content types and presentation; i.e., KML, XML, Flash video, etc.

Effective WCM is business driven with ITY playing an enabling, rather than controlling, role. Identification of a limited number of supported environments that can support core agency and specialized requirements is in the best interest of the State. Web 2.0 toolsets need to be identified and clearly integrated into any WCM platform environment.

References

CMS Matrix www.cmsmatrix.org.

McNabb, Kyle and Powers, Stephen, *The Forrester Wave™: Web Content Management For External Sites*, Q3 2007, Forrester Research, Inc., July 16, 2007.

Open Source Web Content Management: DotNetNuke, Magnolia, Nuxeo, and Plone, Info-Tech Advisor Premium Small Enterprise Applications: Product Evaluation, May 09, 2007

Powers, Stephen, et al. *Five Pitfalls to Avoid In Web Content Management Implementations*, Best Practices, Forrester Research, Inc., February 23, 2007.

Web Content Management: FatWire Software, Info-Tech Advisor Premium Applications: Product Evaluation, February 22, 2007.

Web Content Management: Microsoft, Info-Tech Advisor Premium Applications: Product Evaluation, February 23, 2007.

Web Content Management Solutions, Info-Tech Advisor Premium Applications: Product Comparison, February 22, 2007.

Web Content Management: Interwoven, Info-Tech Advisor Premium Applications: Product Evaluation, February 23, 2007.

Web Content Management: EMC/Documentum, Info-Tech Advisor Premium Applications: Product Evaluation, February 26, 2007.

Web Content Management: Tridion, Info-Tech Advisor Premium Applications: Product Evaluation, February 22, 2007.

Web Content Management: Vignette, Info-Tech Advisor Premium Applications: Product Evaluation, February 23, 2007.

Web Content Management: Oracle/Stellent, Info-Tech Advisor Premium Applications: Product Evaluation, February 23, 2007.

Web Content Management: Open Text/RedDot, Info-Tech Advisor Premium Applications: Product Evaluation, February 23, 2007.

Web Content Management on ColdFusion: Hot Banana and PaperThin, Info-Tech Advisor Premium Small Enterprise Applications: Product Evaluation, May 09, 2007.

Web Content Management Solutions for Small Enterprises, Info-Tech Advisor Premium Small Enterprise Applications: Product comparison, May 09, 2007.

Web Content Management on Java: Magnolia and Serena Software, Info-Tech Advisor Premium Small Enterprise Applications: Product Evaluation, May 09, 2007.

Web Content Management on .NET: Ektron, Sitecore, and DotNetNuke, Info-Tech Advisor Premium Small Enterprise Applications: Product Evaluation, May 09, 2007

Wikipedia, Web Content Management System,
http://en.wikipedia.org/wiki/Web_content_management_system